**FINAL AS-IS ENTERPRISE ARCHITECTURE DESCRIPTION**

July 16, 2003

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# EXECUTIVE SUMMARY

## ES1.0  BACKGROUND

The United States is engaged in a war on terror that puts the Department of Homeland Security (DHS) on the front lines.  DHS faces the unique challenge of bringing together 22 formerly separate agencies into a cohesive department to accomplish this mission.  These challenges include unifying multiple field structures, blending the cultures of each agency, standardizing data to improve information sharing, integrating many of its existing 700 applications, and integrating Information Technology (IT).

DHS also faces unique opportunities to meet these challenges.  The DHS has embarked on an Enterprise Architecture (EA) Planning Project as a beginning point for integrating the DHS business processes, data, application systems, and IT.  This gives the DHS the opportunity to shape the organization from the outset with a baseline characterization framework in place for establishing a modern, adaptable, and interoperable set of IT applications based on the business needs of DHS.  The DHS EA will form a framework and plan for how the DHS will transform and evolve from the current ("As-Is") state of business capabilities and IT to a future suite of capabilities more integrated and focused on achieving the DHS mission.

## ES2.0  PURPOSE

The purpose of this document is to describe the major characteristics of the DHS enterprise and to provide a reference point for future EA development and transition planning.  This baseline characterization provides a high-level assessment of the current environment within which DHS operates, evaluating business and information needs.  This document is a review of over 170 documents containing approximately 9,000 pages of un-classified information about DHS and is a characterization rather than an operational audit.

> Note:  The scope of this document is to present a characterization of the existing DHS organization based on readily available information.  The characterization is not intended to be a detailed inventory of applications, processes, locations, and data elements.  Further analysis and refinement is required.

## ES3.0  SUMMARY OF MAJOR FINDINGS

- There are approximately 180,000 employees in DHS; nearly two thirds of whom directly support Border and Transportation Security (BTS) activities.

- Activities (such as securing the border, providing intelligence data, and identifying targets of interest) are conducted by many of the DHS legacy agencies.

- A clear and consistent method of sharing information and data across DHS does not exist.

- Over 300 applications perform some variety of back-office operations.

- The ability to prevent and respond to terrorist events is a function identified within at least 46 legacy agency applications.DHS has in excess of 1,000 servers and 1,000 various telecommunications circuits clustered throughout the United States.

- DHS conducts a wide range of activities, from inspecting cargo to conducting advanced scientific research.

## 1.0    INTRODUCTION

The United States is engaged in a war on terror that puts the Department of Homeland Security (DHS) on the front lines.  DHS merges 22 agencies into a single, cohesive department within the Federal government with the primary mission to "protect the American people and their homeland."[1]  The new organization unifies principal agencies that support Border and Transportation Security (BTS), coordinates a cohesive network of disaster response capabilities, creates a central point for analysis and dissemination of information, and joins research and development efforts to detect and counter-terrorist attacks.

DHS faces the unique challenge of bringing together 22 formerly separate agencies into a cohesive and integrated DHS to accomplish these priorities.  Those challenges faced by DHS include the following:[2]

- Unifying multiple field structures

- Reconciling cultures of each agency

- Integrating multiple border-security and interior-enforcement functions

- Integrating application systems

- Integrating Information Technology (IT)

- Realigning staff

- Developing new business processes

- Improving information sharing

Successful performance of DHS missions is highly dependent on providing operational decision makers with appropriate, accurate, and timely information upon which to base their decisions. The baseline characterization is the first step in establishing the "To-Be" architecture and the transition strategy required to obtain it.

However, DHS also faces a unique opportunity.  The DHS has embarked on an Enterprise Architecture (EA) Planning Project as a beginning point for integrating the DHS business processes, data, application systems, and IT.  This gives the DHS the opportunity to shape the organization from the outset with a framework in place for establishing a modern, adaptable, and interoperable set of IT applications based upon the business needs of DHS.  The DHS EA will form a framework and plan for how the DHS will transform and evolve from the current ("As-Is") state of business capabilities and IT to a future suite of capabilities more integrated and focused on achieving the DHS mission.

### 1.1    Purpose

The purpose of this baseline characterization is to describe the major characteristics of the DHS enterprise from an IT perspective and to provide a reference point for future EA development

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[1]  As stated in "The Department of Homeland Security Budget for Fiscal Year 2004."

[2]  Office of Homeland Security, *National Strategy for Homeland Security*, July 2002. http://www.dhs.gov/interweb/assetlibrary/nat_strat_hls.pdf>

and transition planning.  The baseline characterization provides a high-level assessment of the current environment within which DHS operates.  The document is a review of readily available information about DHS and is a characterization, not an operational audit.  The baseline characterization looks at the business activities, data, applications, and information technology currently in use by legacy agencies.  Also included within the characterization is a view of some of the FY 2004 Office of Management and Budget (OMB) 300s (initiatives).  Section 2.1 provides further detail regarding the framework used to perform this baseline characterization.  Exhibit 1 presents a graphical representation of this approach.  Further detail describing the baseline characterization framework is contained later in this document (mission areas are summarized in this graphic and are described in Section 2.1).

**Exhibit 1:  Baseline Characterization Frame**
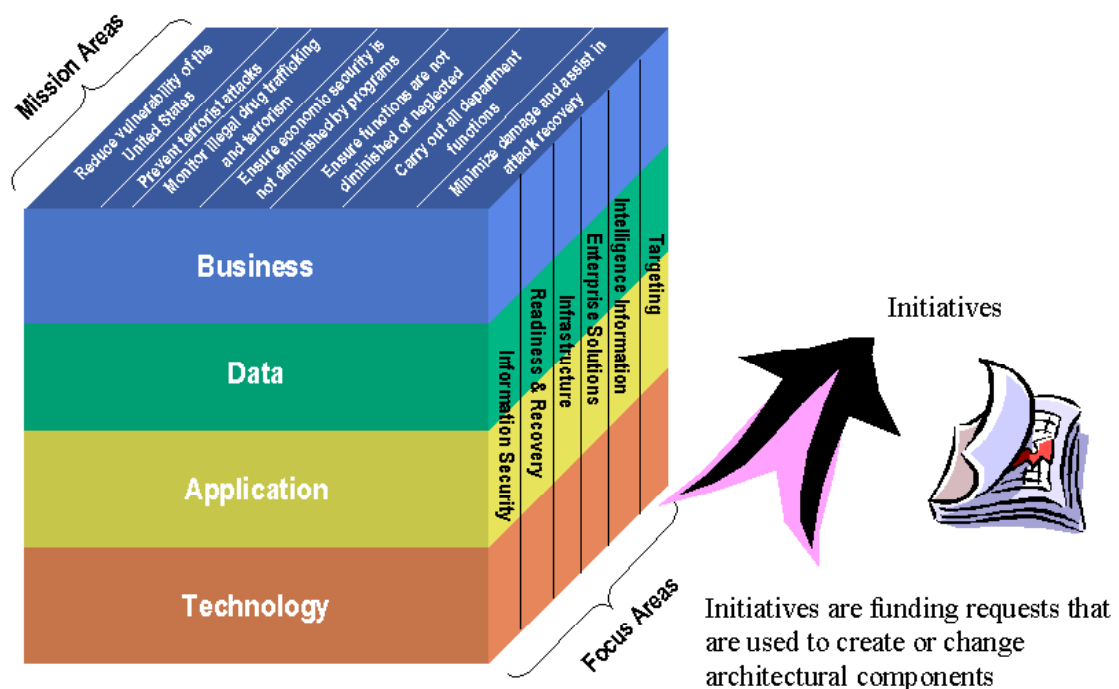


The baseline characterization framework is based upon best practice EA standards such as those described in the Federal Enterprise Architecture (FEA) and FEA Framework (FEAF).  This document is the first in a series of EA products that will be produced by DHS.  The DHS EA will develop a series of work related products including:

- A To-Be business model describing the high-level business activities and functions that should be performed across DHS to accomplish its mission in an integrated manner.

- A transition strategy that guides, in part, challenging modernization and consolidation investment decisions.

- A To-Be, or target architecture that helps to define a forward-leaning, dynamic EA that is responsive to DHS culture, businesses, and missions.

> Note:   The scope of this document is to present a characterization of the existing DHS organization based on readily available information.  The characterization is not intended to be a detailed inventory of applications, processes, locations, and data elements.  Further analysis and refinement is required.

## 1.2   Summary of Major Characterization Findings

This baseline characterization summarizes, at a high level, the findings from the various reviews of government-furnished information.  For purposes of document organization, each of these findings will also be repeated within its appropriate section as a major finding.  When a particular view (section of the characterization) has additional findings, they will be labeled as additional characterization findings.

- The current state of DHS architectural artifacts does not lend itself to a full operational audit.  The current EA artifacts were developed while DHS organizations were still part of their legacy agencies, prior to DHS operational start in March 2003.  As a result, there are inconsistencies in structure across the legacy EA artifacts requires further definition.

- Nearly two thirds of all DHS employees (113,800) support BTS activities.

- Considerable overlap may exist in the business activities among the various legacy agencies that comprise DHS.  Legacy agencies were found to have redundancies in several business activities; including human resources, financial management, procurement, and some mission-specific areas.

- A standard definition of the types of high-level entities (data objects) required to support their missions was not uniformly available from all legacy agencies. The characterization found that data entities (such as "person") may be defined as a "baggage screener" or a "passenger" entering the country, whereas a "document" category may be defined as a "manifest," "permit," or "certificate."

- DHS has over 300 IT applications that are back-office in nature and perform functions such as budgeting, financial management, recruiting, and human resource management.

- DHS has in excess of 1,000 servers and 1,000 various telecommunications circuits clustered throughout the United States and international countries.

- DHS initiatives (OMB Exhibit 300s) have significant overlap.  Fourteen initiatives were identified, for example, that have a primary emphasis on supporting credentialing types of activities.

- Thirty-four initiatives are aligned to at least one e-Government initiative or could use the new General Services Administration (GSA) Smart Buy program. (Note:  Smart Buy is a new program that consolidates the government's purchasing power for technology acquisitions.)

- The existing DHS Technical Reference Model (TRM) document is incomplete in that it may not adequately address how to provide a common DHS IT standards profile.  While the current DHS TRM illustrates a mapping to the first Tier of the FEA TRM (FTRM), it may not give sufficient detail to allow the mapping required to respond to future OMB requirements.

## 2.0    FRAMEWORK FOR ASSESSMENT

A baseline characterization framework was developed to provide a means for standardizing legacy agency EA products, concept of operations documents, interview notes, and several large lists of applications and inventory infrastructure.

### 2.1    Framework

The baseline characterization framework is a tool used to align the available legacy EA artifact information (artifacts) to architectural views, mission areas, and focus areas in a reasonable and comparable manner.

One basis of comparison and analysis is based on focus areas.  DHS defined seven business focus areas, which will provide the business context for merging and integrating programs and processes from the previously 22 separate agencies into one coherent organization.  The focus areas are independent of mission areas and are another way of looking at the processes and systems that DHS uses.  Focus areas may, in the long run, become consolidated investments and projects.   These focus areas are listed in Exhibit 2.  Subsequent sections of this document will examine how well the data and applications support those focus areas.  Exhibit 2 details each of the focus areas provided by DHS and their associated definitions.

**Exhibit 2:  Focus Areas**

| Focus Area | Definition |
|---|---|
| Targeting | Application of patterns and assessing of risks to determine whether additional protective measures are called for. |
| Intelligence information | Includes the fusion of intelligence (actually creating patterns of vulnerability, threat, risk). |
| Identity credentialing | Includes objects that determine, ensure, or issue identity related products (licenses, manifests). |
| Readiness and recovery | Includes objects that promote the country's ability to manage and recover from events. |
| Enterprise solutions | Includes objects that are administrative in nature such as back office operations. |
| Infrastructure | Includes objects that support the connectivity and networks. |
| Information security | Includes the protection, detection, and mitigation of threats to the information processed, stored, and transmitted by information systems. |

### 2.2    Mission Areas

The mission areas were obtained from the Homeland Security Act of 2002 and include:

- Minimize the damage, and assist in the recovery, from terrorist attacks that do occur within the United States.

- Prevent terrorist attacks within the United States.

- Reduce the vulnerability of the United States to terrorism.

- Carry out all functions of entities transferred to the Department, including by acting as a focal point regarding natural and manmade crises and emergency planning.

- Ensure that the overall economic security of the United States is not diminished by efforts, activities, and programs aimed at securing the homeland.

- Monitor connections between illegal drug trafficking and terrorism, coordinate efforts to sever such connections, and otherwise contribute to efforts to interdict illegal drug trafficking.

- Ensure functions of the agencies and subdivisions within the Department that are not related directly to securing the homeland are not diminished or neglected by a specific explicit Act of Congress.

Exhibit 3 provides an overview of the baseline characterization framework (described in Exhibit 1) and the criteria used to characterize the available information.

**Exhibit 3:  Framework Summar**y

| Framework View | Description | Criteria Used for Alignment |
|---|---|---|
| Business Activities | Each artifact was reviewed for business functions and activities. | Mission and focus areas.<br><br>Note:  All mission areas came from the Homeland Security Act of 2002, and all focus areas were provided by government experts and represent specific areas of interest. |
| Data | Each artifact was reviewed to identify high-level sets of data. | Mission and focus areas |
| Applications | Each artifact was reviewed to identify applications.  Each application was aligned to mission and focus areas.  Applications were further aligned to application patterns and application types. (See section three for further information on application patterns and application types) | Mission and focus areas.<br><br>Application patterns (definitions taken from IBM patterns for e-business)<br><br>Application types (definitions taken from FEA Service Reference Model [FSRM]) |
| Technology | DHS TRM document was used for analysis.  (This document was provided by DHS).  Additional infrastructure analysis was done with government furnished inventory information. | The TRM was characterized only in context of certain technology components that appeared to be needed.  Infrastructure was aligned from a hardware and telecom circuit basis across DHS locations. |
| Initiatives | DHS provided 75 initiatives cases.  Each initiative was aligned to FEA Business Reference Model (FBRM) sub-functions, mission areas, and focus areas. | Mission and focus areas.<br>FBRM sub-functions. |

## 3.0    BASELINE CHARACTERIZATION

This document (and its associated attachments) forms the initial baseline characterization of the DHS current IT applications and business functions.  The baseline characterization is a description of the current DHS environment, not an operational audit.  The characterization uses the baseline characterization framework described in Section 2 to create views of the various architectural components.  To create the characterization, the following steps were taken:

- The data collected from the DHS organizations was based on documentation that is readily available.  This data contained information about business functions, data entities, applications, technology inventories, and existing EA work products.

- The baseline characterization framework (described in Section 2.1) characterized the legacy EA artifacts and information against the baseline characterization framework to support the analysis.

- The legacy agencies about which information was analyzed in preparing this baseline characterization provided the bulk of the information and represent about 80 percent of all DHS employees.  Attachment L provides a more detailed list of which organizations were included in the characterization.  The legacy agencies  are as follows:[3]

  - U.S. Customs Service (Customs)

  - Immigration and Naturalization Service (INS)

  - Transportation Security Agency (TSA)

  - U.S. Coast Guard (USCG)

  - U. S. Secret Service (USSS)

  - Federal Law Enforcement Training Center (FLETC)

  - Animal and Plant Health Inspection Service (APHIS)

Each of the legacy agencies provided some level of documentation describing business functions, data entities, technology, and applications.  Those legacy agencies that had developed EA documentation used a variety of methodologies and frameworks.  This variety of approaches provided a challenge in comparing and characterizing each of the artifacts.

### 3.1    Business Characterization Findings

The Business Characterization describes the business activities conducted by DHS and looks at the distribution of human resources supporting those business activities and some of the locations where DHS business activities occur.

- Major Characterization Findings include the following:

  - Nearly two thirds of all DHS employees (113,800) work supporting BTS activities.

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[3] Source:*Remarks by Secretary of Homeland Security, Tom Ridge, to the National Press Club*  April 29, 2003, and *DHS Budget in Brief - Fiscal Year 2004* www.dhs.gov/dhspublic <http://www.dhs.gov/dhspublic> <<http://www.dhs.gov/dhspublic>>

- Considerable overlap may exist in the business activities among the various legacy organizations that make up DHS. This is particularly true in the Administrative area, as shown in Exhibit 5.

- A wide range of activities are conducted within DHS, from inspecting cargo to conducting advanced scientific research.

- Additional Characterization Findings include the following:

  - DHS business activities are conducted in a set of diverse business locations, from highway checkpoints through ships to offices.

  - The large number of legacy EA artifact business activities aligned to targeting and intelligence sharing focus areas present an example of the redundancy across DHS, and potential areas for collaboration and standardization. Each legacy agency was identified as having at least one unique business activity that supports these two focus areas.

### 3.1.1 Detailed Business View

Several legacy organizations within DHS conducted EA planning efforts, which identified business activities within each organization. The characterization used the products of these efforts to provide the high-level business activities used within the document. These business activities were aligned to the mission areas of DHS as well as to a focus area (see Attachments B and C). The criteria used for the alignment relied on the "readily apparent" precept. Business activities were aligned if their description provided a "readily apparent" alignment to a particular mission or focus area. These alignments may require further analysis and verification across DHS. Exhibit 4 shows that, even within the defined mission area of preventing terrorist attacks, legacy agencies have different types of business activities that might be performing similar functions all. This exhibit describes an opportunity around activities that contribute to preventing terrorist attacks in the sense that there might be opportunities for process re-engineering. The business activities in this exhibit may have two focus areas aligned to them because some business activities can support multiple focus areas (defined in Section 2). Alignment of business activities to DHS organizations and legacy organizations was based on readily available information.

**Exhibit 4: Business Activities Aligned to the Prevent Terrorist Attacks Mission Area**

| Legacy Agency | DHS Organization | Business Activity | Focus Area 1 | Focus Area 2 |
|---|---|---|---|---|
| TSA | BTS | Manage air transportation | Intelligence | Readiness and Recovery |
| TSA | BTS | Manage maritime/land transportation | Intelligence | Readiness and Recovery |
| TSA | BTS | Defense and national security operations: intelligence | Intelligence | |
| TSA | BTS | Security technology | Intelligence | Readiness and Recovery |

| Legacy Agency | DHS Organization | Business Activity | Focus Area 1 | Focus Area 2 |
|---|---|---|---|---|
| Secret Service | USSS | Manage Records | Readiness and Recovery | |
| Secret Service | USSS | Produce and manage protective intelligence | Intelligence | |
| Office for Domestic Preparedness (ODP) | BTS | Provide Training and technical assistance | Readiness and Recovery | |
| ODP | BTS | Provide Grants Assistance (E-grants) | Enterprise Solutions | |
| ODP | BTS | Track Grants | | |
| Nuclear Incident Response Team (NIRT) | Emergency Preparedness and Response Directorate (EP&R) | Conduct Nuclear event exercises | Readiness and Recovery | |
| NIRT | EP&R | Establish and certify nuclear standards | Readiness and Recovery | |
| INS | Bureau of Citizenship and Immigration Services (BCIS) | Authorize Legal Immigration, Temporary Residence, and Stay | Identity Credentialing | Targeting |
| INS | Bureau of Customs and Border Protection (CBP) | Deter Illegal Entry and Facilitate Legal Entry | Identity Credentialing | Targeting |
| INS | Bureau of Immigration and Customs Enforcement (ICE) | Find and Detain Illegal Aliens | Targeting | Intelligence |
| INS | CBP | Manage Removals and Exits | Identity Credentialing | Targeting |
| INS | BCIS | Manage Removals and Exits | Identity Credentialing | Targeting |
| INS | ICE | Manage Removals and Exits | Identity Credentialing | Targeting |
| INS | ICE | Provide Enterprise Information & Intelligence | Intelligence | Targeting |

| Legacy Agency | DHS Organization | Business Activity | Focus Area 1 | Focus Area 2 |
|---|---|---|---|---|
| INS | CBP | Provide Enterprise Information & Intelligence | Intelligence | Targeting |
| INS | BCIS | Provide Enterprise Information & Intelligence | Intelligence | Targeting |
| Federal Protective Service (FPS) | BTS | Conduct Criminal investigations | Targeting | |
| FPS | BTS | Manage weapons and ammunition | Intelligence | |
| FPS | BTS | Security planning | Readiness and Recovery | |
| FPS | BTS | Track Criminal Information | Targeting | |
| Federal Emergency Management Agency (FEMA) | EP&R | Provide recovery social services | Readiness and Recovery | |
| FEMA | EP&R | Conduct training | Readiness and Recovery | |
| FEMA | EP&R | Manage information technology | Readiness and Recovery | |
| FEMA | EP&R | Advise on programs and policies | Enterprise Solutions | |
| FEMA | EP&R | Collect terrorist intelligence | Intelligence | Readiness and Recovery |
| FEMA | EP&R | Provide recovery social services | Readiness and Recovery | |
| Customs | BTS | Provide intelligence | Intelligence | Targeting |
| Customs | BTS | Investigate Transnational crimes | Targeting | |
| Customs | BTS | Maintain passenger identification data | Intelligence | Identity Credentialing |
| Customs | BTS | Provide intelligence | Intelligence | Targeting |
| Coast Guard | USCG | Manage Marine Mobility | Readiness and Recovery | |
| Coast Guard | USCG | Perform Prevention Activities | Readiness and Recovery | |
| Coast Guard | USCG | National Defense | Readiness and Recovery | Intelligence |
| CBP | BTS | Manage entry of goods | Intelligence | |
| APHIS | BTS | Conduct intelligence gathering | Intelligence | |

| Legacy Agency | DHS Organization | Business Activity | Focus Area 1 | Focus Area 2 |
|---|---|---|---|---|
| N/A | Information Analysis and Infrastructure Protection (IAIP) | Provide indications and warnings of cyber attacks | Readiness and Recovery | Intelligence |
| N/A | Science and Technology (S&T) | Manage and develop research related to biological and chemical warfare agents | Readiness and Recovery | |
| N/A | S&T | Research national vulnerabilities with respect to catastrophic terrorist acts. | Readiness and Recovery | Intelligence |
| N/A | IAIP | Manage the information collection and dissemination of terrorist information. | Readiness and Recovery | Intelligence |

This alignment provides an example of the variety of business activities conducted within DHS. Activities range from "authorize legal immigration" to "manage and develop research related to biological and chemical warfare agents."

The characterization also provides an opportunity to examine potential areas of overlap and areas for consolidation. For example, Exhibit 4 shows there are at least seven activities conducted by multiple legacy agencies that involve collecting intelligence and information on criminals and criminal activity. This is clearly an area that is a candidate for consolidation. Attachment C provides additional detail on the business activities performed by the legacy agencies. Exhibit 5 presents business activities at the readiness focus area. This exhibit further shows that within this discreet focus area, DHS has legacy agencies performing similar business activities. It also demonstrates potential opportunities for process re-engineering.

**Exhibit 5: Departmental Business Activities at the Readiness and Recovery Focus Area**

| Business Activity | Legacy Agency | DHS Organization |
|---|---|---|
| Assess statewide needs | ODP | BTS |
| Build international coalitions | APHIS | BTS |
| Conduct Nuclear event exercises | NIRT | EP&R |
| Conduct Search and rescue | Coast Guard | USCG |
| Enforce maritime law | Coast Guard | USCG |
| Equipment assistance and support | ODP | BTS |
| Establish and certify nuclear standards | NIRT | EP&R |
| Evaluate effectiveness | Coast Guard | USCG |
| Exercise Development and Support | ODP | BTS |
| Facilitate Agricultural Exports | APHIS | BTS |

| Business Activity | Legacy Agency | DHS Organization |
|---|---|---|
| Provide Laboratory and Scientific Services | Customs | BTS |
| Manage and develop research related to biological and chemical warfare agents | | S&T |
| Manage cross cutting issues | Information not available | State and Local Coordination |
| Manage export controls | Customs | BTS |
| Manage external agency coordination | FEMA | EP&R |
| Manage Federal disaster recover programs | FEMA | EP&R |
| Manage Flood insurance | FEMA | EP&R |
| Manage hazard analysis | FEMA | EP&R |
| Manage hazardous material | FEMA | EP&R |
| Manage industry infrastructure protection partnerships | Information not available | IAIP |
| Manage information and planning | FEMA | EP&R |
| Manage international services | APHIS | BTS |
| Manage major events | Secret Service | USSS |
| Manage Maritime Security | Coast Guard | USCG |

Exhibit 6 details the relationship between the unique financial management and human resource business activities and similar systems. Unique activities can, in fact, represent hundreds of sub-business processes. The results depicted in Exhibit 6 show that each of the legacy agencies, at a minimum, has a full set of business activities for each of these administrative areas. These activities and systems may present opportunities for consolidation and are currently being addressed by several task forces within DHS. This exhibit further demonstrates that, within these two particular sets of business activities, there is an extensive amount of existing infrastructure within legacy agency organizations that could present DHS with opportunities for re-engineering and consolidation.

**Exhibit 6: Administrative Business Activities to Systems**

| Business Activity | Number of Unique Business Activities | Number of Applications aligning to the Business Activity |
|---|---|---|
| Human Resources | 8 | 75+ |
| Financial Management | 6 | 75+ |

### 3.1.2  DHS Organization

DHS is a diverse organization comprising a field structure that spans 42 districts, 21 sectors, and 20 management centers domestically, as well as over 100 international offices in 43 countries.

DHS is organized into the following seven directorates and elements that support the major DHS priorities:

- Directorates
  - Border and Transportation Security
  - Emergency Preparedness and Response
  - Information Analysis and Infrastructure Protection
  - Science and Technology
- Elements
  - Bureau of Citizenship and Immigration
  - U.S. Coast Guard
  - U.S. Secret Service

Exhibit 7 shows the legacy agencies, their missions (taken from legacy agency strategy documents, legislation, and Web sites, where available) and how they fit into DHS. The first column shows the DHS organizations. The second column lists legacy agency re-assignment to the DHS organization. It highlights the challenges facing DHS in merging distinct and diverse legacy agencies with their respective business processes while integrating their workforces into one coherent and cohesive organization working toward securing the homeland.

### 3.1.3 DHS Workforce

Exhibit 6 shows the distribution of approximately 90 percent of the DHS workforce across the legacy agencies.[4] Less than 10 percent of the current workforce supports the combined missions of Science and Technology, Emergency Preparedness and Response, and Information Analysis and Infrastructure Protection. Nearly two-thirds of the workforce supports the Border and Transportation Security Directorate.

### 3.1.4 DHS Locations

Within the U.S., there are hundreds of Ports of Entry (POE) into the U.S., including land, sea, and airports. Land POEs stretch across 7,500 miles of land border between the U.S. and Mexico and Canada and 95,000 miles of shoreline and navigable rivers. The conditions and venues where the business activities are performed vary considerably, from air and sea POEs in New York City with dozens of employees to a single Secret Service employee on foot.

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[4] Data for some agencies were not readily available.

## Exhibit 7:  One Organization with 180,000 Employees

| DHS Organization | Legacy Agency | Employees | Mission |
|---|---|---|---|
| **Border and Transportation Security** | | 113,800 | To prevent, preempt, and deter aggression targeted at the U.S. through land sea and air POEs; to enforce the laws regarding the admission of foreign born persons into the U.S.; and to ensure that all goods and persons entering and exiting the U.S. do so legally. |
| | APHIS | 6,000 | APHIS is responsible for protecting and promoting U.S. agricultural health, administering the Animal Welfare Act, and carrying out wildlife damage management activities. |
| | FLETC | 800 | To serve as the Federal government leader for and provider of world-class law enforcement training; to prepare new and experienced law enforcement professionals to fulfill their responsibilities in a safe manner and at the highest level of proficiency; to ensure that training is provided in the most cost-effective manner by taking advantage of economies of scale available only from a consolidated law enforcement training organization. |
| | Customs | 21,200 | To control all carriers, persons, and articles entering and leaving the United States. |
| | TSA | 53,000 | To protect the Nation's transportation systems to ensure freedom of movement for people and commerce. |
| | Federal Protective Service | 14,000 | To provide a safe environment that is open, and inviting, in a professional and cost effective manner, permitting Federal agencies and members of the public to conduct their business without fear of violence, crime or disorder. |
| | INS Enforcement | 20,000 | To enforce the immigration laws of the United States. |
| **Citizenship and Immigration Services** | | 14,400 | To deliver services to the public in a timely, consistent, fair, and high quality manner. |
| | INS Services | 14,400 | To provide benefits and services to legally admissible aliens. |

| DHS Organization | Legacy Agency | Employees | Mission |
|---|---|---|---|
| **Coast Guard** | | 40,000 | To remain constantly ready to defend the United States while also ensuring national security and protecting national interests; to minimize loss of life and property, personal injury and property damage at sea in U.S. waters; enforce U.S. laws and international agreements of the United States; ensure the safety and security of maritime transportation, ports, waterways and shore facilities; to promote maritime transportation and other waterborne activity in support of national economic, scientific, defense and social needs; to protect the marine environment and its wildlife and ensure an effective U.S. presence in polar regions; to protect the interests of the United States in relationships with other maritime nations worldwide; assist other agencies in performance of their duties and cooperates in joint maritime ventures. |
| | Coast Guard | 40,000 | To remain constantly ready to defend the United States while also ensuring national security and protecting national interests; to minimize loss of life and property, personal injury and property damage at sea in U.S. waters; enforce U.S. laws and international agreements of the United States; ensure the safety and security of maritime transportation, ports, waterways and shore facilities; to promote maritime transportation and other waterborne activity in support of national economic, scientific, defense and social needs; to protect the marine environment and its wildlife and ensure an effective U.S. presence in polar regions; to protect the interests of the United States in relationships with other maritime nations worldwide; assist other agencies in performance of their duties and cooperates in joint maritime ventures. |
| **Emergency Preparedness and Response** | | | Ensure that our nation is prepared for catastrophes - whether natural disasters or terrorist assaults. Not only will the Directorate coordinate with first responders, it will oversee the federal government's national response and recovery strategy. |
| | FEMA | 2,600 | The mission of FEMA is to reduce the loss of life and property and protect our institutions from all hazards by leading and supporting the Nation in a comprehensive, risk-based emergency management program of mitigation, preparedness, response, and recovery: |

| DHS Organization | Legacy Agency | Employees | Mission |
|---|---|---|---|
| | Office for Domestic Preparedness | Program Office | To develop and implement a national program to enhance the capacity of state and local agencies to respond to incidents of domestic terrorism, particularly those involving Weapons of Mass Destruction (WMD), through coordinated training, equipment acquisition, technical assistance, and support for Federal, state, and local exercises. |
| **Information Analysis and Infrastructure Protection** | | | To analyze law enforcement, intelligence, and other information to evaluate terrorist threats to the homeland; assess the vulnerabilities of key US resources and critical infrastructures; mapping threat information against our current vulnerabilities; and working with federal, state, local, and private stakeholders to issue timely warnings and take or effect appropriate preventive and protection action. |
| | Critical Infrastructure Assurance Program | | Coordinate and implement the national strategy. Assess the U.S. Government's own risk exposure and dependencies on critical infrastructure. Raise awareness and educate public understanding and participation in critical infrastructure protection efforts. Coordinate legislative and public affairs to integrate infrastructure assurance objectives into the public and private sectors |
| | Federal Computer Incident Response Center (FedCIRC) | | FedCIRC is the Federal Civilian Government's trusted focal point for computer security incident reporting, providing assistance with incident prevention and response. |
| | National Communications System | | To ensure the availability of national security and emergency preparedness communications. |
| | National Infrastructure Simulation and Analysis Center | | Provide fundamentally new modeling and simulation capabilities for the analysis of critical infrastructures, their interdependencies, vulnerabilities, and complexities. |
| | The National Infrastructure Protection Center | | To identify, analyze and reduce cyber threats and vulnerabilities; disseminate threat warning information; coordinate incident response; and provide technical assistance in continuity of operations and recovery planning |

| DHS Organization | Legacy Agency | Employees | Mission |
|---|---|---|---|
| **Science and Technology** | | | To advance homeland security through basic and applied research, development, test and evaluation, construction or modification of systems |
| | National Biological Weapons Defense Analysis Center | | |
| | Plum Island Animal Disease Center | 180 | The Plum Island Animal Disease Center is responsible for research and diagnosis to protect United States animal industries and exports against catastrophic economic losses caused by Foreign Animal Disease (FAD) agents accidentally or deliberately introduced into the U.S. |
| **Secret Service** | Secret Service | 2100 | To ensure the security of the President, the Vice President and other dignitaries and designated individuals; to enforce laws relating to obligations and securities of the United States and financial crimes such as financial institution fraud and other fraud; and to protect the White House and other buildings within the Washington, DC, area. |

However, most agencies perform work in multiple environments and, in fact, most agencies perform some work in all of these work environments. For example, virtually all agencies perform some administrative work in an office environment. INS and Customs also perform work in a mobile environment, at training facilities, at international sites and at holding facilities. Many TSA employees also work on aircraft. The Customs Service and Plum Island Animal Disease Center, in spite of their diverse missions, also perform business activities at animal-care facilities. This is not intended to be an exhaustive account of all DHS workplace environments. However, it does suggest that DHS will need to apply flexible rules and business process for managing its many business activities through multiple work environments.

Work environments represent the type of place where a business activity is performed. Exhibit 8 shows a sample of the different types of primary work environments. As the exhibit shows, there is a range of primary workplace types from performing business activities on foot, to performing business activities at a research laboratory. The work environment is directly related to the primary mission of the agency. The Secret Service is primarily responsible for the protection of certain individuals; at Plum Island, the primary responsibility is research of animal diseases. The following exhibit provides a high-level view of DHS work environments.

**Exhibit 8: DHS Work Environments**

| Agency | Primary Work Environment |
|---|---|
| Customs | Border stations and ports of entry |
| Secret Service | Mobile environment, such as foot, vehicle, aircraft |
| Coast Guard | Mobile, particularly watercraft |
| FEMA | Office through emergency operations centers. However, FEMA has 4,000 standby disaster-assistance employees who work in a mobile environment at disaster sites. |
| FPS | Office |
| Plum Island Animal Disease Center | Laboratory |
| TSA | Air ports of entry |
| INS Enforcement | Border stations and ports of entry |
| INS Services (Benefits) | Office |
| FLETC | Training Facilities |

## 3.2    Data Characterization View

The Data characterization view focuses on describing (characterization) the information currently used to support the business processes and functions within DHS.

- Major Characterization Findings:

  − A standard definition of the types of high-level information (data objects) required to support their missions were not uniformly available from all legacy agencies. The characterization found that entities (such as "person") may be defined as a "baggage

screener" or a "passenger" entering the country, whereas a "document" category may be defined as a "manifest," "permit," or "certificate."

   − A clear and consistent method of sharing information and data across was not available for review.

- Additional Characterization Findings:

   − Legacy agencies use disparate definitions and types of data throughout the various enterprises. Intelligence information, for example, has in excess of 17 different types of data associated with it.

### 3.2.1 Detailed Data Architecture View

High-level sets of information (i.e. data objects) span traditional agency organizational boundaries to address the sharing of information and resources by providing a standard way for business processes and applications to share information. The use of data is particularly important given the need to share DHS data across Federal, state, local, and tribal organizations.

### 3.2.2 Major Data Objects

The data objects are meant to represent the types of high level information used across DHS. One data object can be related to hundreds of separate actual pieces of information.

The data characterization describes the various data objects found throughout DHS in context of the data sharing challenge identified by the General Accounting Office (GAO).[5] Exhibit 9 describes a sample of the characterization. It details data objects that readily relate to the information that agencies use to support the DHS focus area, Targeting. Within Exhibit 9, a higher category of data (super-type) is used. The super-type relationship is used to show that as the data objects are categorized (normalized) to a common definition of person, event, or physical location, DHS has many legacy agencies using data to target but using different names to describe similar data objects. Exhibit 9 shows that within the targeting focus area DHS has may have several good opportunities available for consolidating the data used in support of the targeting focus area. The details of this view are contained in Attachment D. Attachment E provides similar view except from an intelligence sharing perspective. This set of data objects is based on information provided by DHS and may require additional refinement.

### Exhibit 9: Data Objects Used for Targeting (Examples)

| Focus Area | Data Object | Super Type | Legacy Agency | DHS Organization |
|---|---|---|---|---|
| Targeting | Criminal Information | | FPS | BTS |
| Targeting | Laboratory results | | Customs | BTS |
| Targeting | Customer | Person | TSA | BTS |

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[5] "Homeland Security: Information Sharing Responsibilities, Challenges, and Key Management Issues Statement" of Robert F. Dacey, Director, Information Security Issues, Randolph C. Hite, Director, Information Technology Architecture and Systems Issues, Thursday, May 8, 2003, p.5

| Focus Area | Data Object | Super Type | Legacy Agency | DHS Organization |
|---|---|---|---|---|
| Targeting | Passenger | Person | Customs | BTS |
| Targeting | Passenger | Person | TSA | BTS |
| Targeting | Person | Person | TSA | BTS |
| Targeting | Person | Person | INS | BCIS |
| Targeting | Party | Person | INS | BCIS |
| Targeting | Case | Person | INS | BTS |
| Targeting | Case | Person | INS | BCIS |
| Targeting | Inspection | Event | TSA | BTS |
| Targeting | Event | Event | INS | BTS |
| Targeting | Inquiry | Event | TSA | BTS |
| Targeting | Event | Event | TSA | BTS |
| Targeting | Threat | | TSA | BTS |
| Targeting | Counter-measure | | TSA | BTS |
| Targeting | Cargo | Physical Location | TSA | BTS |
| Targeting | Checkpoint | Physical location | TSA | BTS |
| Targeting | Border | Physical Location | TSA | BTS |

## 3.3    Application Characterization View

The purpose of the application architecture section is to characterize the existing "As-Is" application systems used by the legacy agencies within DHS.  Included within this view is a description of each system, which legacy agency is using it, which DHS organization is using it, how it is used, and the type of application.

- Major Characterization Findings:

    - DHS has over 300 applications that are back-office in nature and perform functions; such as budgeting, financial management, recruiting, and HR.

    - The ability to prevent and respond to terrorist events is a function identified within at least 46 legacy agency applications.

    - Only 12 applications could be identified as aligning to the mission areas of "minimizing damage from terrorist attacks" and "ensuring overall economic security is not diminished by homeland security activities."

- Additional Characterization Findings:

  - There were 250+ applications that are aligned to a focus area, but did not align to a mission area. These applications were typically back-office in nature and performed functions such as finance and human resources.[6]

Exhibit 10 is a matrix that presents, at a summary level (summary at focus and mission area), the number of applications that aligned to certain mission and focus areas across DHS. (Attachment H contains a detailed listing of all applications). This exhibit may help planners and architects to focus on mission areas that are underserved or may have too many applications. An example of an area that may be underserved is applications that readily aligned with the "minimizing damage" and "ensuring that the overall economic security of the U.S. is not diminished by DHS activities" mission areas. DHS, in the context of this exhibit, may have an opportunity to address a particular mission area that may be underserved.

**Exhibit 10: Applications to Mission and Focus Area.**

| Mission Areas | Focus Areas | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Targeting | Intelligence Information | Credentialing | Preparedness | Infrastructure | Enterprise Solutions |
| Prevent terrorist attacks within the United States | 24 | 14 | 2 | 4 | 2 | 0 |
| Reduce the vulnerability of the United States to terrorism | 18 | 10 | 4 | 8 | 2 | 2 |
| Minimize the damage, and assist in the recovery, from terrorist attacks that do occur within the United States. | 0 | 0 | 0 | *6* | 0 | 0 |
| Carry out all functions of entities transferred to DHS, including by acting as a focal point regarding natural and manmade crises and emergency planning. | 0 | 0 | 0 | 23 | 0 | 36 |
| Ensure functions of the agencies and subdivisions within DHS that are not related directly to securing the homeland are not diminished or neglected except by a specific explicit Act of Congress. | 4 | 9 | 13 | 44 | 8 | 35 |
| Ensure that the overall economic security of the United states is not diminished by efforts, activities, and programs aimed at securing the homeland. | 3 | 0 | 2 | 0 | 0 | 1 |

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[6] Applications and their descriptions were obtained from inventories provided by DHS. The alignments between applications and mission/focus areas were created by the characterization team and contain un-classified information.

| | Focus Areas | | | | | |
|---|---|---|---|---|---|---|
| **Mission Areas** | **Targeting** | **Intelligence Information** | **Credentialing** | **Preparedness** | **Infrastructure** | **Enterprise Solutions** |
| Monitor connections between illegal drug trafficking and terrorism, coordinate efforts to sever such connections, and otherwise contribute to efforts to interdict illegal drug trafficking.[7] | 0 | 0 | 0 | 0 | 0 | 0 |

### 3.3.1   Detailed Application Architecture View

Exhibit 2 summarized the criteria used to align applications within DHS.  Exhibit 11 provides a more detailed definition of each of the criteria used to characterize and align the approximately 700+ DHS applications.[8]  Criteria were defined so as to provide DHS with a means of understanding the characterization findings.

**Exhibit 11:  Application Characterization Criteria**

| Criteria | How It Is Used |
|---|---|
| Mission/Focus area | Applications that "readily" aligned to a DHS mission or focus area. |
| Application Types | These definitions were taken from the Federal service reference model (FSRM v1.0) and are used to describe the type of application (e.g. Customer Relationship Management [CRM], analysis/statistics, content management)[9] |
| Application Patterns | Patterns indicate what the system does with the data (more detailed information regarding patterns is included in Section 3.3.1.2).  Patterns include: <br>• Information aggregation (takes data in and processes it) <br>• Collaboration (sharing of data) <br>• Extended enterprise (integrated across multiple applications and organizations) <br>• Portal (Web-based presence that consolidates many functions into a common interface) <br>• Self service (an application designed to allow customers to perform tasks directly).[10] |

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[7]  Only unclassified information was reviewed for this characterization.

[8]  Applications provided in systems inventory.

[9]  FEA Program Management Office (PMO) Service Reference Model (SRM) V1.0

[10]  IBM patterns for e-business http://www-106.ibm.com/developerworks/patterns/map.html

Exhibits 12 and 13 describe how applications aligned across the focus areas. Exhibit 12 shows the distribution of applications across all the focus areas. Exhibit 13 shows the types of applications that aligned within the targeting focus area. A more detailed listing of every application is included within Attachment H. These exhibits provide DHS with a perspective of the types of applications and how they are used by legacy agencies.

**Exhibit 12: Distribution of Applications across Focus Areas**
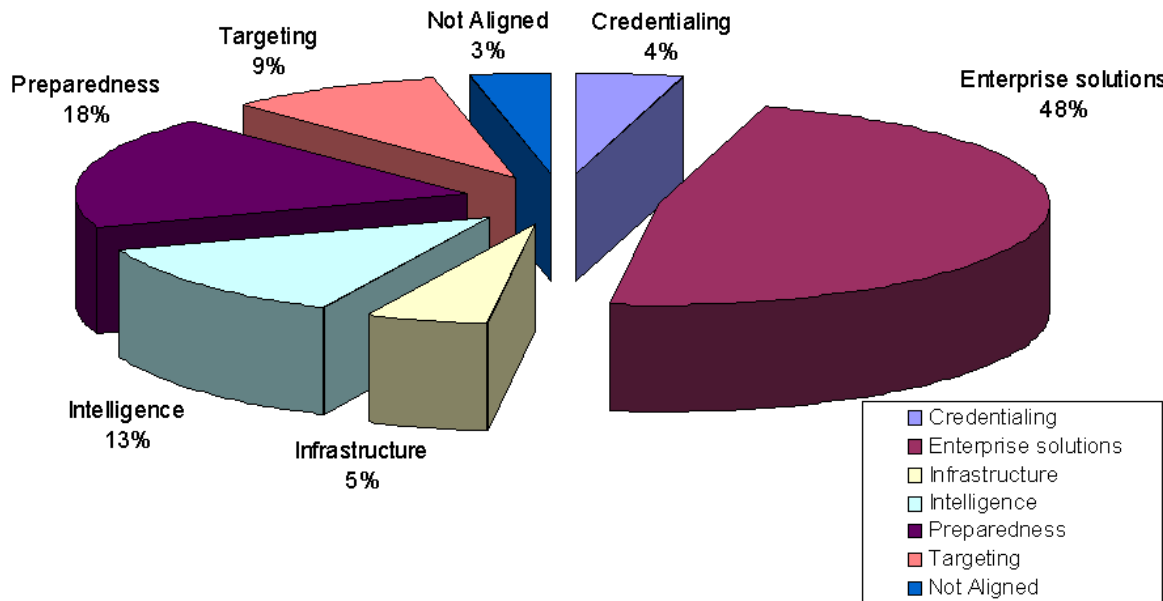


Note: Not Aligned indicates applications that were not readily apparent with respect to their alignment with a focus area.

**Exhibit 13: Types of Applications within the Targeting Focus Area**
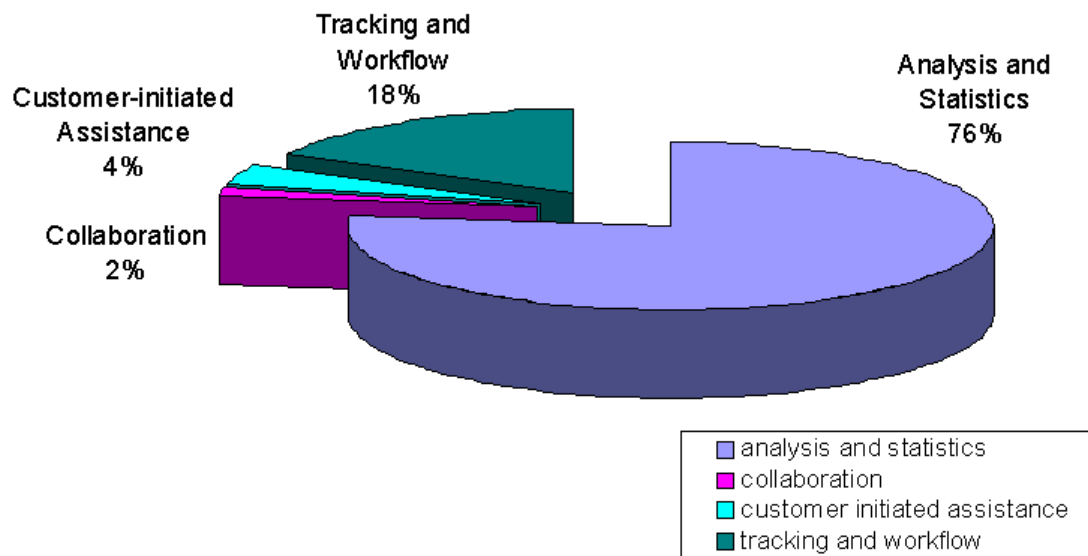
Application Types include the following:

- Tracking and Workflow: Defines the set of capabilities that support information that pertains to the history, current status or future projections of an organization.

- Analysis and Statistics: Defines the set of capabilities that support the examination of business issues, problems and their solutions.

- Customer Initiated Assistance: Defines the set of capabilities that allow customers to proactively seek assistance and service from an organization.

### 3.3.1.1 Application Types

The FSRM was used[11] to create a set of the application type categories. The model provided a common definition for each application type, shown in the Exhibit 14 (services).[12] Service areas (application types) are high-level categories for specific types of services that the application provides. The specific services used in the characterization are detailed in Exhibit 14. A service (type of application) represents the functionality that the application provides (Specific definitions for service types can be found in the FSRM included as Attachment N).

**Exhibit 14: Application Types in Federal Enterprise Architecture Service Reference Model**

| Service Area | Services[13] |
|---|---|
| Customer Services | • Customer Preferences<br>• Customer Relationship Management<br>• Customer Initiated Assistance |
| Process Automation Services | • Tracking and Workflow<br>• Routing and Automation |
| Business Management Services | • Management of Process<br>• Organizational Management<br>• Supply Chain Management<br>• Investment Management |
| Digital Asset Services | • Content Management<br>• Knowledge Management<br>• Document Management<br>• Records Management |
| Business Analytical Services | • Analysis and Statistics<br>• Business Intelligence<br>• Visualization<br>• Reporting |

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[11] Not all FSRM service areas were used.

[12] FEA SRM v1.0 p. 8

[13] Services in this column were used for the characterization of applications.

| Service Area | Services[13] |
|---|---|
| Back Office Services | • Data Management<br>• Human Resources<br>• Financial Management<br>• Manuals/Materials Management<br>• Development and Integration<br>• Human Capital/Workforce Management |
| Support Services | • Security Management<br>• Systems Management<br>• Forms<br>• Communications<br>• Collaboration<br>• Search |

### 3.3.1.2    Application Patterns

Patterns represent the way users of applications interact with and use the underlying applications. Patterns can be a self-service transaction or can include a transaction across an extended enterprise.  Exhibit 15 describes the patterns used in this analysis and how they were used to standardize the DHS applications.[14]

**Exhibit 15:  Patterns of Interaction**

| Pattern | Description | Use Within Characterization |
|---|---|---|
| Self service | Users interact with enterprise transactions and data.  CRM applications are an example of this pattern put to use. | Applications aligned to this pattern involve Web query and customer service applications. |
| Collaboration | Users collaborate with one another through e-mail, shared documents, etc.  Example:  collaboration across teams on document development | Applications aligned to this pattern include those that promote the sharing of information or utilize collaborative communication technologies. |
| Information aggregation | Users employ tools to extract useful information from large volumes of data, text, images, video, etc.  This includes Business Intelligence and Knowledge Management. Example:  evaluation of user purchasing preferences. | This pattern represents the majority of DHS applications. Applications aligned to this pattern typically processed data and provided users with analysis based on the data. |

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[14]  IBM Patterns for e-Business, http://www-106.ibm.com/developerworks/patterns/map.html

| Pattern | Description | Use Within Characterization |
|---|---|---|
| Portal | This Composite pattern can be used to develop highly complex Portal applications that offer multiple services to users at one centralized location. | Applications aligned to this pattern were either pure portal applications or applications that consolidate many sub-applications into one user interface. |
| Extended enterprise | This pattern enables programmatic links between arms-length businesses (where a trading partner agreement might be appropriate). | Applications aligned to this pattern typically integrated across DHS and with other Federal agencies. |

### 3.3.2   Examples of Applications Sharing Mission and Focus Areas[15]

In a recent speech, Senator Fritz Hollings stated that a recent labor strike at ports in the West Coast cost approximately $2 billion per day in economic impact.  Senator Hollings went on to say that, if a dirty bomb imported through a container were to be detonated, the economic impact would make the port strike look insignificant.[16]  The ability to prevent dirty bomb attacks and target potential threats goes to the core of the DHS mission.  The successful execution of targeting includes not only preventing attacks but also increasing the number of people or cargo that can be assessed for risk potential.  Exhibit 16 presents a view of a sample set of applications that appear to be used by DHS to target and prevent potential terrorist threats.  The set of applications listed in Exhibit 15 and their associated appendices provide DHS with a set of applications that might represent opportunities for integration and consolidation in context of improving DHS ability to target and identify potential threats.  The relationships presented in Exhibits 16 and 17 are contained in their full form in Attachments F, G, and H.

**Exhibit 16:  Examples of Applications That Assist in the Prevention of Terrorist Attacks through Targeting**

| Legacy Agency | Name of Application | DHS Organization | Pattern | Application Type[17] |
|---|---|---|---|---|
| Customs | Treasury Enforcement Communications System | BTS | Extended Enterprise | Analysis and Statistics |
| Customs | Border Release Advance Screening and Selectivity | BTS | Extended Enterprise | Tracking and Workflow |
| Customs | Customs Automated Port Profile System | BTS | Information Aggregation | Analysis and Statistics |
| Customs | Interagency Border Inspection System | BTS | Information Aggregation | Analysis and Statistics |

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[15]  Sample sets of applications are indented to provide a cross-section.

[16]  Sen. Hollings' plan to protect ports passes Senate S.C. senator calls for $2 billion to keep facilities safe from attacks, By Lauren Markoe Washington Bureau, The State.com

[17] Application types are defined in Section 3.3.1.1 and in the FSRM attachment (O)

| Legacy Agency | Name of Application | DHS Organization | Pattern | Application Type[17] |
|---|---|---|---|---|
| TSA | Computer-Aided Passenger Prescreening System (CAPPS) II | BTS | Information Aggregation | Analysis and Statistics |
| TSA | CAPPSI | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Access Control Server (ACS) Security Summary | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Approved Foreign Flight Crew | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Cargo Security | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Known Shipper Database | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Law Enforcement Message Switch | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Passenger Screening Data | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Performance and Results Information System | BTS | Information Aggregation | Analysis and Statistics |

For a detailed listing of all the aligned systems, refer to Attachment F.

### 3.3.3   Examples of Applications That Support the Intelligence Focus Area

Intelligence sharing is a critical function of DHS.  A recent Congressional Research Service research report stated that no single agency or office in the Federal government prior to September 11, 2001, was in a position to "connect the dots" among intelligence information.[18] The DHS focus area, share intelligence information, is primarily centered on improving this problem.  Exhibit 17 provides an example set of applications that may currently be used to support intelligence information sharing.  These applications, when evaluated further, may present opportunities for consolidation and integration that may contribute to the improvement of DHS intelligence information sharing capabilities.

**Exhibit 17:  Examples of Applications that Assist in Preventing Terrorism Through the Use of Intelligence Information**

| Legacy Agency | Name | DHS Organization | Pattern | Type |
|---|---|---|---|---|
| Customs | Advanced Passenger Information System (APIS) | BTS | Information Aggregation | Analysis and Statistics |

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[18]  Homeland Security: Intelligence Support, Richard A. Best, Jr. Specialist in National Defense Foreign Affairs, Defense, and Trade Division, CRS. March 2003. P.1

| Legacy Agency | Name | DHS Organization | Pattern | Type |
|---|---|---|---|---|
| Coast Guard | Tactical Data Management System | USCG | Information Aggregation | Analysis and Statistics |
| INS | AFIX Tracker (finger and palm print identifier software) | BTS | Information Aggregation | Analysis and Statistics |
| FPS | FPS Criminal Intelligence System | BTS | Information Aggregation | Analysis and Statistics |
| TSA | Civilian Aviation Security | BTS | Information Aggregation | Analysis and Statistics |
| USSS | Protective Research Information System | USSS | Information Aggregation | Analysis and Statistics |

Attachment G also describes applications that were not aligned to specific mission areas, but aligned to the enterprise-solution focus area. Applications within this group are typically back-office in nature. The alignment of this set of applications to existing e-Government initiatives, for example, could present DHS with significant consolidation opportunities. Exhibit 18 displays (a sample set), by e-Government initiative, the number of DHS applications (and types of applications) that may potentially align to e-Government initiatives. Exhibit 18 is only representative and requires further study but if DHS focuses on the set of applications that aligned to the USA Services e-Government initiative, for example, a potential opportunity for the consolidation of 18 applications may exist.

**Exhibit 18: Example Set of Applications that May Align to Existing e-Government Initiatives**

| e-Government Initiative | e-Government Initiative Description[19] | Types of DHS Applications | Number of Applications[20] |
|---|---|---|---|
| USA Services | Develop and deploy government wide citizen customer service using industry best practices that will provide citizens with timely, consistent responses about government information and services. | • Customer Initiated Assistance | 12 |
| | | • CRM | 6 |
| One-stop Business Compliance | Reduces the burden on businesses by making it easy to find, understand, and comply with relevant laws and regulations at all levels of government. | • Tracking and Workflow | 8[21] |
| | | • Analysis and statistics | 10 |

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[19] 2003 President's e-Government strategy, www.egov.gov

[20] The alignment of applications to e-Gov initiatives was conducted by the characterization team. Alignments were made where DHS applications appeared to have similar definitions with e-Gov initiatives.

[21] Business compliance was not an application characterization criterion. The eight applications were identified through the "Ensure overall economic security" mission area.

| e-Government Initiative | e-Government Initiative Description[19] | Types of DHS Applications | Number of Applications[20] |
|---|---|---|---|
| GEO Spatial One-stop | Provides Federal and state agencies with single-point of access to map-related data enabling consolidation of redundant data. | • Visualization | 13 |
| Disaster Management | Provides Federal, state and local emergency managers' online access to disaster management-related information, planning and response tools. | • Analysis and statistics[22] | 2 |
| | | • Communication | 1 |
| | | • Financial Management | 2 |
| | | • Human capital | 1 |
| | | • Org. Mgmt | 1 |
| | | • Records Mgmt | 2 |
| | | • Tracking and workflow | 4 |
| SAFECOM | Provides interoperable wireless solutions for Federal, state and local public safety organizations and ensures they can communicate and share information as they respond to emergency incidents. | • Collaboration | 12 |
| | | • Communication[23] | 1 |
| E-Grants | Creates a single, online portal for all Federal grant customers to find and apply for grants, thus making it easier for potential recipients to obtain information about Federal grants. | • Analysis and statistics | 7 |
| | | • Records management | 1 |
| | | • Tracking and workflow | 4 |
| | | • Customer-initiated assistance | 3 |

## 3.4    Technology Characterization View

The technology characterization view provides an overview of the current DHS TRM and the DHS infrastructure.  The DHS TRM is included as Attachment P.

• Major Characterization Findings:

  – DHS has in excess of 1,000 servers and 1,000 various telecommunication circuits clustered throughout the United States.

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[22]  These applications were identified through their alignment with the "Emergency focal point mission area."

[23]  This application is a communication type of application that aligned as an enterprise solution.  TSA PDA system

- The existing DHS TRM document is incomplete in that it may not adequately address a common standards profile. While it illustrates a mapping to the first Tier of the FTRM, it may not give sufficient detail to allow the mapping required to respond to future OMB requirements. The attached Standards Profile is also minimal and represents only those areas where de facto standards exist because of coincidental use of common products in existing bureau TRMs.

- Additional Characterization Findings:

  - The use of domains related to users, integration, and communications have not been established. These domains describe the way technology is used to enable items, such as a common directory or communications infrastructure.

  - Potential areas of infrastructure redundancy can be seen in states, New York for example. In New York, five DHS legacy agencies are represented with using over 30 servers and consuming 50+ telecommunications circuits (T1s, T3s, and various Asynchronous Transfer Mode (ATM)/Frame Relay virtual circuit connections).[24]

### 3.4.1 Technical Reference Model Detailed View

The DHS TRM is a high level representation of the relationships between technologies within DHS. The TRM is currently under development. Exhibit 19 depicts the current DHS TRM. Attachment P contains the detailed definitions for the TRM components.

**Exhibit 19: Technical Reference Model**
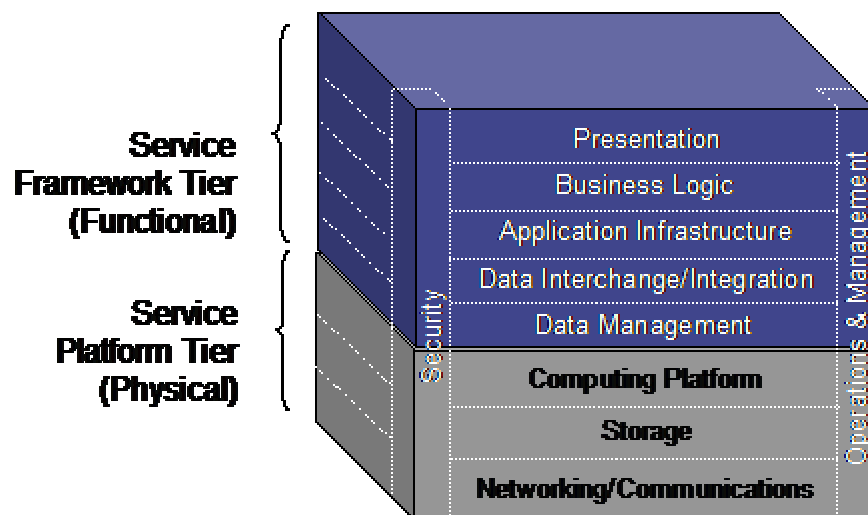


### 3.4.2 Technology Infrastructure Detailed View

The infrastructure inventories provided by DHS were reviewed. Attachment I contains the detailed inventory of all DHS infrastructure. Exhibit 20 provides a high-level sample of the

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[24] Information about circuits was obtained from DHS inventory worksheets. It was not always clear if the resource was shared or owned with another non-DHS organization. These numbers are meant to represent orders of magnitude and are not indented to be an operational audit.

characterization.[25]  The infrastructure inventory (Attachment I) represents six legacy agencies, every state in the nation plus numerous international locations, thousands of workstations, and multiple types of network topologies.  The inventory information used in this characterization was provided by DHS in the form of high-level inventories and requires further investigation and analysis.

**Exhibit 20:  Infrastructure Distribution**
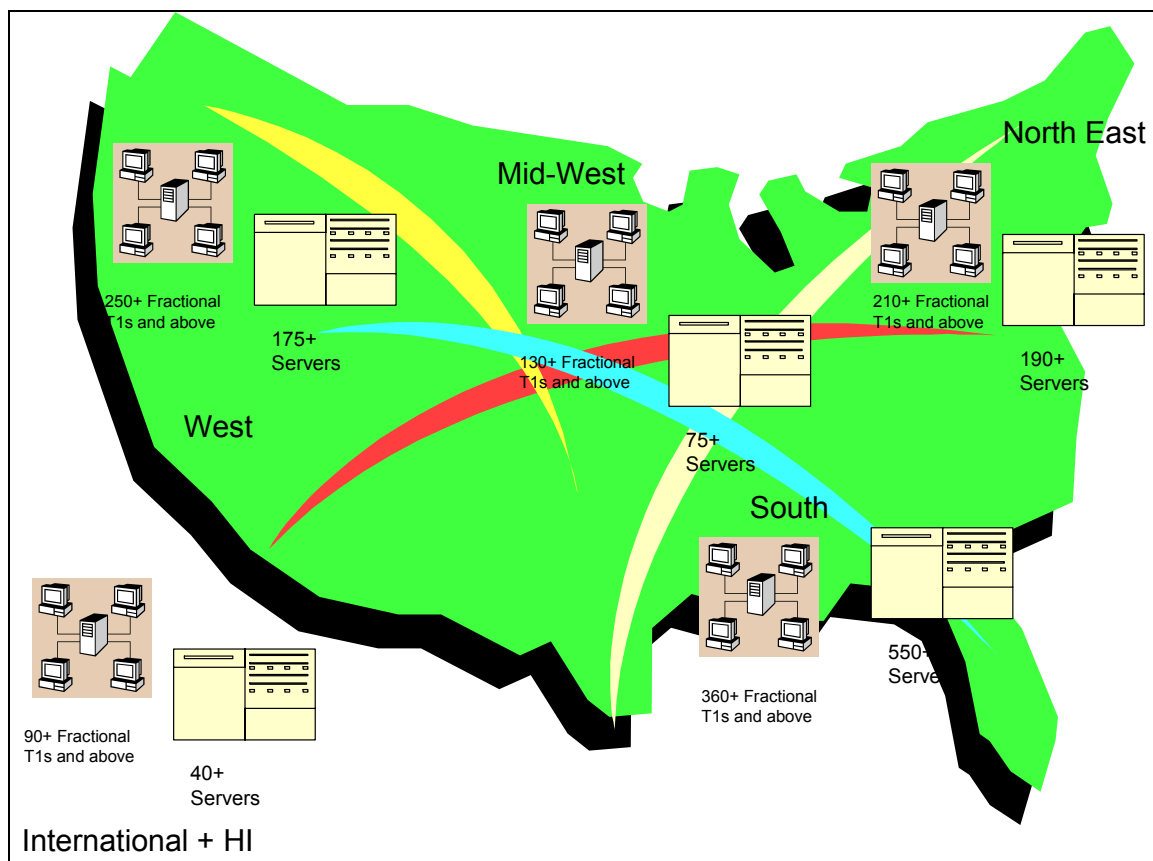


## 3.5    Initiative Characterization View

The characterization focuses on 75[26] of the FY 2004 initiatives, as described in the legacy agency's FY04 Exhibit 300 submissions to OMB.  Although initiatives are not traditionally viewed as architectural components DHS, as part of its effort to characterize its current state of affairs, requested that the characterization team address a set of FY 2004 initiatives.

- Major Characterization Findings:

    - DHS initiatives (OMB Exhibit 300s) have significant overlap.  Fourteen initiatives, for example, were identified that aligned to the credentialing focus area.

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[25]  Inventory provided does not include classified information.

[26]  During the creation of this characterization, it was not known which of the 75 initiatives delivered were actually funded for the FY 2004 budget cycle.

- Thirty-four initiatives aligned to at least one e-Government initiative or might be able to make use of the new GSA Smart Buy program.

- Additional Characterization Findings:

  - DHS has 30 initiatives that were mapped to five or more FBRM sub-functions. This finding can be indicative of the need for more correlation between the EA process and the Capital Planning and Investment Process (CPIC). Initiatives across DHS should map to FBRM sub-functions using similar practices and processes.

  - Nineteen initiatives align to the FBRM sub-function of border control. This finding indicates that DHS has an opportunity to focus on the set of initiatives that share common FBRM sub-functions.

  - Opportunities for improving the CPIC exist. Many of the initiatives were found to map to multiple FBRM sub-functions (some more than 10). A consolidated Capital Planning and EA process would ensure that this multiple mapping is uniformly applied.

### 3.5.1 Initiative Detailed View

The characterization focused on 75[27] of the FY 2004 initiatives. The list described in Exhibit 21 is not the full set of all FY 2004 business cases submitted by legacy agencies but was the list available for review. The detailed view is contained in Attachment J. Exhibit 21 lists the legacy agencies and number of initiatives that were included within the characterization.

**Exhibit 21: Initiatives Cases**

| Agency | Number of Initiatives Reviewed |
| --- | --- |
| INS | 20 |
| FEMA | 20 |
| FLETC | 1 |
| Secret Service | 5 |
| Customs | 9 |
| Coast Guard | 10 |
| TSA | 9 |

### 3.5.2 Initiative Alignments

DHS has 30+ initiatives that were mapped to five or more FBRM sub-functions.[28] Exhibit 22 demonstrates that to ensure consistent mapping of FBRM sub-functions across DHS a consolidated CPIC process may be appropriate. A tightly integrated CPIC and EA process can ensure that initiatives are aligned to FBRM sub-functions in a uniform fashion. DHS, as a new organization, has an opportunity to dramatically change the way its initiative authors and

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[27] During the creation of this characterization, it was not known which of the 75 initiatives delivered were actually funded for the FY 2004 budget cycle.

[28] Sample views are sets of cross-DHS initiatives.

architecture planners interact so that initiatives represent projects that contribute to the entire DHS and not to just one legacy agency.

**Exhibit 22:  Sample OMB Exhibit 300 Initiatives Aligned to Five or More Sub-Functions**

| Initiative | FBRM Sub-Functions | Legacy Agency | New Organization |
|---|---|---|---|
| Automated Commercial Environment (ACE) | Criminal Investigation and Surveillance | Customs | BTS |
| | Permit Issuing and Control | Customs | BTS |
| | Border Control | Customs | BTS |
| | Information Collection | Customs | BTS |
| | License Issuing and Control | Customs | BTS |
| | Criminal Apprehension | Customs | BTS |
| | Firearms and Explosives Safety | Customs | BTS |
| | Record Retention | Customs | BTS |
| | Anti-Terrorism | Customs | BTS |
| | Data & Statistics Development | Customs | BTS |
| | Consumer Products Quality Assurance | Customs | BTS |
| | Citizen Protection | Customs | BTS |
| | Merchandise Inspection | Customs | BTS |
| | Substance Control | Customs | BTS |
| | Crime Prevention | Customs | BTS |
| | Tariffs/Quota Monitoring | Customs | BTS |
| | Information Sharing | Customs | BTS |
| | Intellectual Property Protection | Customs | BTS |
| Computer-Linked Application Information Management System  (CLAIMS) 3 | Information Collection | INS | BCIS |
| | Information Sharing | INS | BCIS |
| | Permit Issuing and Control | INS | BCIS |
| | Record Retention | INS | BCIS |
| | Information Collection | INS | BCIS |
| | License Issuing and Control | INS | BCIS |
| Disaster Management e-Government Initiative | Disaster Monitoring and Prediction | FEMA | EP&R |
| | Loans Assistance | FEMA | EP&R |
| | Grants Assistance | FEMA | EP&R |
| | Medical Services | FEMA | EP&R |
| | Insurance Issuing | FEMA | EP&R |

| Initiative | FBRM Sub-Functions | Legacy Agency | New Organization |
|---|---|---|---|
| | Emergency Response | FEMA | EP&R |
| | Insurance Servicing | FEMA | EP&R |
| | Housing Benefits | FEMA | EP&R |
| | Disaster Preparedness/Planning | FEMA | EP&R |
| | Disaster Repair and Restore | FEMA | EP&R |
| Enterprise Software Modernization | Anti-Terrorism | Secret Service | USSS |
| | Leadership protection | Secret Service | USSS |
| | Property Protection | Secret Service | USSS |
| | Intelligence Gathering | Secret Service | USSS |
| | Resource Training and Development | Secret Service | USSS |
| | Intellectual Property Protection | Secret Service | USSS |
| | Criminal investigation and surveillance | Secret Service | USSS |

To understand the collaboration potential between DHS initiatives, Exhibit 23 presents a sample view of initiatives that aligned to the same set of FBRM sub-functions (Border Control). Initiatives within the same FBRM sub-functions may present opportunities for collaboration and consolidation.

**Exhibit 23:  Initiatives Aligned to Border Control**

| FBRM sub-Functions | Name | Legacy Agency | New Organization |
|---|---|---|---|
| Border Control | Advance Passenger Information System | Customs | BTS |
| Border Control | Automated Commercial Environment | Customs | BTS |
| Border Control | Automated Commercial System Life Support | Customs | BTS |
| Border Control | Automated Export System | Customs | BTS |
| Border Control | Automated Targeting System | Customs | BTS |
| Border Control | Automated Biometric Identification System | INS | BTS |
| Border Control | CAPPSII | TSA | BTS |
| Border Control | Central Index System | INS | BCIS |
| Border Control | Customs Secure Data Network | Customs | BTS |
| Border Control | Enforcement Case Tracking System (Enforce) and Enforcement Integrated Database (EID) | INS | BTS |
| Border Control | Enterprise Information Project | INS | BCIS |

| FBRM sub-Functions | Name | Legacy Agency | New Organization |
|---|---|---|---|
| Border Control | Immigration Services Modernization | INS | BCIS |
| Border Control | Integrated Surveillance Intelligence System | INS | BTS |
| Border Control | International Trade Data System | Customs | BTS |
| Border Control | Person Identification Project | INS | BTS |
| Border Control | Ports and Waterways Safety System | Coast Guard | USCG |
| Border Control | Student and Exchange Visitor Information System (SEVIS) | INS | BTS |

Exhibit 23 demonstrates, at a minimum, that there may be opportunities for collaboration on specific technology investments across the DHS enterprise. The detailed analysis of this characterization is contained in Attachment J.

Exhibit 24 details, by FBRM sub-function, the number of initiatives aligned across DHS. An approach for identifying consolidation opportunities may be to examine Exhibit 24 for FBRM sub-functions that have many initiatives mapped to them. Additionally, Exhibit 24 may be used to look at FBRM sub-functions that have few initiatives mapped to them. Budget Formulation , for example, only has one initiative mapped to it, and may indicate an area where a given application could be set as a standard and used to fulfill all DHS requirement for this area. Program evaluation, which measures the effectiveness of DHS programs, only has three initiatives mapped to it. Each of these areas represents a potential set of opportunities for DHS investigation. The detailed view of this section is contained in Attachment K.

**Exhibit 24: Initiatives to FBRM Sub-Functions**

| FBRM sub-function | # | FBRM sub-function | # | FBRM sub-function | # | FBRM sub-function | # |
|---|---|---|---|---|---|---|---|
| Advising and Consulting | 1 | Enterprise Information | 1 | Intelligence Gathering | 5 | Policy and Guidance Development | 2 |
| Air Traffic Control | 1 | Environmental Remediation | 2 | Inventory Control | 3 | Pollution Protection and Control | 1 |
| Anti-Terrorism | 20 | Export Promotion | 2 | IT Infrastructure Maintenance | 6 | Program Evaluation | 3 |
| Border Control | 17 | External Training and Education | 3 | Judicial Hearings | 2 | Program Monitoring | 2 |
| Budget Execution | 1 | Facilities, Fleet, and Equipment Management | 1 | Labor Management | 2 | Property Protection | 7 |
| Budget | 1 | Facilities, Fleet, and | 1 | Land | 2 | Public Records/Data | 3 |

| FBRM sub-function | # | FBRM sub-function | # | FBRM sub-function | # | FBRM sub-function | # |
|---|---|---|---|---|---|---|---|
| Formulation | | Equipment Management | | Transportation | | Management | |
| Business/Industry Developments | 1 | Financial Asset Management | 7 | Leadership protection | 5 | Public Relations | 1 |
| Citizen Protection | 5 | Financial Reporting | 4 | Legal Defense | 1 | Real Property Management | 1 |
| Communications and Outreach | 3 | Firearms and Explosives Safety | 2 | Legal Investigations | 2 | Record Retention | 8 |
| Consumer Products Quality Assurance | 3 | Food Assistance | 2 | Legal Prosecution/Litigation | 2 | Resource Training and Development | 8 |
| Corrective Action | 1 | Funds Management | 4 | License Issuance and Control | 1 | Rule Publication | 1 |
| Cost Management | 2 | General Ledger Management | 1 | License Issuing and Control | 4 | Security Management | 4 |
| Crime Prevention | 3 | Goods Acquisition | 1 | Lifecycle/Change Management | 2 | Services Acquisition | 1 |
| Criminal Apprehension | 8 | Grants Assistance | 5 | Loans Assistance | 5 | Staff Recruitment and Employment | 1 |
| Criminal Incarceration | 3 | Help Desk Services | 4 | Logistics | 1 | Strategic Planning | 1 |
| Criminal Investigation and Surveillance | 15 | Housing Benefits | 7 | Logistics Management | 2 | Substance Control | 8 |
| Customer Service | 4 | Illness Prevention | 1 | Maritime Transportation | 5 | System Development | 2 |
| Data & Statistics Development | 4 | Information Collection | 13 | Medical Services | 5 | System Maintenance | 2 |
| Debt Collection | 1 | Information sharing | 11 | Merchandise Inspection | 5 | Tariff/Quotes Monitoring | 1 |
| Disaster Monitoring and Prediction | 7 | Insurance Issuing | 8 | Military Operations | 1 | Tariffs/Quota Monitoring | 2 |
| Disaster Preparedness/Planning | 9 | Insurance Services | 1 | Monetary Benefits | 5 | Tax Collection | 1 |
| Disaster Repair and | 10 | Insurance | 8 | Other Revenue | 4 | Trade Law | 5 |

| FBRM sub-function | # | FBRM sub-function | # | FBRM sub-function | # | FBRM sub-function | # |
|---|---|---|---|---|---|---|---|
| Restore | | Servicing | | Collection | | Enforcement | |
| Emergency Response | 8 | Intellectual Property | 1 | Permit Issuance & Control | 1 | Travel | 2 |
| Enterprise Architecture | 3 | Intellectual Property Protection | 10 | Permit Issuing and Control | 9 | Treaties and Agreements | 1 |
| | | Intelligence Gathering | 5 | Personal Property Management | 1 | Workplace Policy Development and Management | 2 |

## 4.0    SUMMARY

The findings and characterizations described in this document, when summarized against a conceptual set of DHS Information Technology challenges in Exhibit 25,[29] provide a meaningful view of the characterization findings.  Providing border security, for example, can be improved with the re-engineering of some 50 unique business processes that are in use across the agency. Modernization, for example, can be improved with DHS-wide adoption of the "Smart buy" method of acquiring information technology assets.

As part of any transitional and developmental strategy, DHS needs to focus on addressing the findings from the characterization and needs to conduct a full "Operational Audit" so that the findings in the characterization can be validated and a more detailed baseline established.

## 4.1    Next Steps

The DHS As-Is baseline characterization is the first step in the creation of the DHS enterprise architecture.  Following the As-Is will come the To-Be business model, To-Be architecture, and a Transition strategy.  The following represent several selected findings and the next steps that could help to address them:

- There may be considerable overlap in the business activities among the various legacy agencies that comprise DHS.  Legacy agencies were found to possibly have redundancies in several business activities including human resources, financial management, procurement, and in some mission specific areas.

  – Analysis of process re-engineering and change management opportunities in the areas of finance and human resources.

  – Analysis of process and system re-engineering opportunities in mission specific areas including intelligence information sharing, targeting, and collaboration.

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[29]  The set of objectives came from a summary of Coast Guard "Pain Points"

**Exhibit 25:  Conceptual DHS Objectives with Characterization Findings**

| IT Challenge | Business Activities | Data | Application | Initiatives (Investments) |
|---|---|---|---|---|
| Real-time Operational Status and Readiness Availability | 80+ current business activities focused on readiness might be consolidated into a consolidated readiness business process. | 30+ unique data objects currently used for readiness might be consolidated into a set of data used to support the IT challenge. | 110 applications covering collaboration, communications, tracking, visualization, and systems management could be leveraged to facilitate this challenge.  Further clarification on the use of these applications and the requirements behind real-time operations is required. | 25+ initiatives addressing functions such as communications, criminal surveillance, monitoring/prediction should be considered as opportunities for consolidated. |
| Modernization | Each organization reported numerous administrative activities that are good opportunities for consolidation. | 126 unique data objects were found across the enterprise. A standard set of data objects should be addressed. | Approximately seven hundred unique applications were identified across DHS. Many applications were in a steady state of operation and used older technologies.  As part of a pattern definition and "To-Be" development these applications might be good candidates for consolidation or integration. | DHS provided 75 unique initiatives. Out of the 75 in excess of 20 initiatives were identified as being an enterprise solution or an infrastructure investment. (This alignment came directly from legacy agency FBRM mappings [exhibit 300 submission]). |

| IT Challenge | Business Activities | Data | Application | Initiatives (Investments) |
|---|---|---|---|---|
| Unified Border Security | In excess of 50 unique business activities were identified as aligning to the border security focus areas (targeting, intelligence, credentialing). To effectively develop a unified border security business process these functions might be good candidates for integration. | In excess of 40 unique data objects were identified across the enterprise. Securing the border properly starts with the right data to the right person at the right time. | In excess of 100 applications support the border security function through targeting, credentialing, and intelligence. | In excess of 30 initiatives were identified as border security, intelligence, or substance control investments. Some of these investments are directly related to securing the border and could be consolidated into a DHS wide approach. |
| Integration | Many legacy organizations identified collaboration and interaction types of activities. DHS as an organization should establish a unified set of processes and approaches with regards to collaboration and interaction. | The legacy agencies have not readily identified the data required by their external partners and customers. Some have developed concept of operations but this should be expanded from a DHS view. | Currently either at the application level or within the technical reference model a DHS wide strategy for systems or process integration was not provided. | Initiatives have in common as many as five or ten FBRM sub-functions. These initiatives should be reviewed from the DHS and Federal level to determine what, if any consolidation opportunities exist. |

- DHS has in excess of 1,000 servers and 1,000 various telecom circuits clustered throughout the United States.

  - A detailed infrastructure and network inventory that may lead to the consolidation and re-deployment of network infrastructure (including servers and telecom circuits).

- A standard definition of the types of high-level information (data objects) required to support their missions were not uniformly available from all legacy agencies. The characterization found that entities (such as "person") may be defined as a "baggage screener" or a "passenger" entering the country, whereas a "document" category may be defined as a "manifest," "permit," or "certificate."

  - A normalized set of application and process activities that is consistent across DHS.

- DHS initiatives (OMB Exhibit 300s) have significant overlap. Fourteen initiatives, for example, were identified that aligned to the credentialing focus area.

  - CPIC and related governance processes that facilitate the integration and consolidation of initiatives across DHS.

- The current state of DHS architectural artifacts does not lend itself to a full operational audit. The current EA artifacts were developed while DHS organizations were still part of their legacy agencies, prior to DHS operational start in March 2003. As a result, there are inconsistencies in structure across the legacy EA artifacts that make an operational audit impractical at this time.

  - A set of validated As-s business processes, applications, and performance measurements.

## 4.2    Conclusion

DHS will continue to build upon the As-Is architecture, which is currently constructed at a very high level, to provide additional depth and detail about the enterprise. This will include continuing to document the current DHS environment thereby assisting in the identification of specific areas of overlap and duplication. With the further development, DHS will begin to examine current work processes as a starting point for change management.